

## CLAIMS

What is claimed is:

1. In a computer network that comprises one or more servers providing one or more services to at least one client, wherein some access to the one or more services may incur an access charge and other access to the one or more services may not incur an access charge, and wherein the at least one client may terminate access to the one or more services in a variety of ways, a method of tracking the at least one client's usage of the one or more services, the method comprising acts of:

receiving a session identifier associated with one or more sessions through which the at least one client accesses the one or more services provided by the one or more servers, the one or more sessions having been created in response to a login request from the at least one client;

receiving one or more metering packets from the at least one client, wherein each of the one or more metering packets includes a time element indicating the client's usage of the one or more services; and

updating a usage database based on the received one or more metering packets so that the usage database reflects the at least one client's usage of the one or more services provided by the one or more servers.

2. A method as recited in claim 1, wherein a plurality of metering packets are received over regular, periodic intervals.

3. A method as recited in claim 1, wherein each of the one or more metering packets is one of a session-ending metering packet and a session-in-progress metering packet.

4. A method as recited in claim 1, further comprising acts of:

receiving a session key associated with the one or more sessions;

hashing at least a portion of each metering packet and the corresponding session key to generate an authentication element; and

comparing the generated authentication element with a packet authentication element included with each metering packet to determine whether or not each packet is genuine.

5. A method as recited in claim 4, wherein a login service receives the login request from and negotiates a given session key with the at least one client, and wherein a census service receives the one or more metering packets, the method further comprising an act of the login service sending a hash of the given session key and a session identifier to the census service, such that the received session key is the hash of the given session key.

6. A method as recited in claim 5, further comprising acts of:

retrieving an indicator from a configuration database indicating that usage should be tracked for all clients attempting to login; and

retrieving an indicator from a database of clients indicating that usage should be tracked for the at least one client.

7. A method as recited in claim 1, wherein a plurality of metering packets are received and wherein one or more of the plurality of received metering packets are redundant, the method further comprising acts of:

prior to updating the usage database, searching a cache of at least one received metering packet;

if a copy of a particular metering packet is found in the cache, identifying the particular metering packet as redundant and not updating the usage database based on the particular metering packet; and

if a copy of the particular metering packet is not found in the cache, adding the particular metering packet to the cache and updating the usage database based on the particular metering packet.

8. A method as recited in claim 7, wherein each metering packet comprises a session identifier element and a sequence number element, and wherein finding the particular metering packet in the cache is based on comparing the session identifier element and the sequence number element that are included with each metering packet.

9. A method as recited in claim 1, wherein the time element comprises a charged time portion corresponding to some access to the one or more services that incurs an access charge, and a free time portion corresponding to other access to the one or more services that does not incur an access charge.

10. A method as recited in claim 9, wherein each metering packet further comprises (i) a packet type element, (ii) a sequence number element, (iii) a session identifier element, and (iv) a packet authentication element.

11. A method as recited in claim 1, further comprising an act of sending one or more headers to the at least one client, wherein the one or more headers include at least one of (i) an indication that the at least one client should track usage of the one or more services provided by the one or more servers, (ii) a unique session identifier, and (iii) a metering interval indicating how frequently the at least one client should send metering packets.

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12. In a computer network that comprises one or more servers providing one or more services to at least one client, wherein some access to the one or more services may incur an access charge and other access to the one or more services may not incur an access charge, and wherein the at least one client may terminate access to the one or more services in a variety of ways, a method of tracking the at least one client's usage of the one or more services, the method comprising steps for:

identifying one or more sessions through which the at least one client accesses the one or more services provided by the one or more servers, the one or more sessions having been created in response to a login request from the at least one client;

monitoring one or more metering packets that are received from the at least one client, wherein each of the one or more metering packets includes a time element indicating the client's usage of the one or more services; and

tracking the at least one client's usage of the one or more services provided by the one or more servers based on the received one or more metering packets.

13. A method as recited in claim 12, wherein a plurality of metering packets are received over regular, periodic intervals, and wherein each of the one or more metering packets is one of a session-ending metering packet and a session-in-progress metering packet.

14. A method as recited in claim 12, further comprising a step for authenticating the one or more metering packets.

15. A method as recited in claim 12, further comprising a step for enabling usage tracking in at least one of a configuration database and a database of clients.

16. A method as recited in claim 12, wherein a plurality of metering packets are received and wherein one or more of the plurality of received metering packets are redundant, the method further comprising a step for discarding the one or more of the plurality of received metering packets that are redundant.

17. A method as recited in claim 12, wherein the time element comprises a charged time portion corresponding to some access to the one or more services that incurs an access charge, and a free time portion corresponding to other access to the one or more services that does not incur an access charge.

18. A method as recited in claim 17, wherein each metering packet further comprises (i) a packet type element, (ii) a sequence number element, (iii) a session identifier element, and (iv) a packet authentication element.

19. A method as recited in claim 12, further comprising a step for communicating one or more usage tracking parameters to the at least one client, wherein the one or more usage tracking parameters include at least one of (i) an indication that the at least one client should track usage of the one or more services provided by the one or more servers, (ii) a unique session identifier, and (iii) a metering interval indicating how frequently the at least one client should send metering packets.

20. A computer program product for implementing, in a computer network that comprises one or more servers providing one or more services to at least one client, wherein some access to the one or more services may incur an access charge and other access to the one or more services may not incur an access charge, and wherein the at least one client may terminate access to the one or more services in a variety of ways, a method of tracking the at least one client's usage of the one or more services, comprising:

a computer readable medium for carrying machine-executable instructions that implement the method, wherein the method comprises steps for:

identifying one or more sessions through which the at least one client accesses the one or more services provided by the one or more servers, the one or more sessions having been created in response to a login request from the at least one client;

monitoring one or more metering packets that are received from the at least one client, wherein each of the one or more metering packets includes a time element indicating the client's usage of the one or more services; and

tracking the at least one client's usage of the one or more services provided by the one or more servers based on the received one or more metering packets.

21. A computer program product as recited in claim 20, wherein a plurality of metering packets are received over regular, periodic intervals, and wherein each of each of the one or more metering packets is one of a session-ending metering packet and a session-in-progress metering packet.

22. A computer program product as recited in claim 20, wherein the method further comprises a step for authenticating the one or more metering packets.

23. A computer program product as recited in claim 20, wherein a plurality of metering packets are received and wherein one or more of the plurality of received metering packets are redundant, the method further comprising a step for discarding the one or more of the plurality of received metering packets that are redundant.

24. A computer program product as recited in claim 20, wherein each metering packet further comprises (i) a packet type element, (ii) a sequence number element, (iii) a session identifier element, and (iv) a packet authentication element, and wherein the time element comprises a charged time portion corresponding to some access to the one or more services that incurs an access charge, and a free time portion corresponding to other access to the one or more services that does not incur an access charge.

25. A computer program product as recited in claim 20, wherein the method further comprises a step for communicating one or more usage tracking parameters to the at least one client, wherein the one or more usage tracking parameters include at least one of (i) an indication that the at least one client should track usage of the one or more services provided by the one or more servers, (ii) a unique session identifier, and (iii) a metering interval indicating how frequently the at least one client should send metering packets.



26. In a computer network that comprises one or more servers providing one or more services to at least one client, wherein some access to the one or more services may incur an access charge and other access to the one or more services may not incur an access charge, and wherein the at least one client may terminate access to the one or more services in a variety of ways, a system for tracking the at least one client's usage of the one or more services, comprising:

a communication means for receiving (i) a session identifier associated with one or more sessions through which the at least one client accesses the one or more services provided by the one or more servers, and (ii) one or more metering packets from the at least one client, wherein each of the one or more metering packets includes a time element indicating the client's usage of the one or more services;

usage means for tracking the at least one client's usage of the one or more services; and

processor means for updating the usage means based on the received one or more metering packets so that the usage means reflects the at least one client's usage of the one or more services provided by the one or more servers.

27. A system as recited in claim 26, further comprising processor means for authenticating the one or more metering packets.

28. A system as recited in claim 26, wherein a plurality of metering packets are received and wherein one or more of the plurality of received metering packets are redundant, the system further comprising processor means for discarding the one or more of the plurality of received metering packets that are redundant.

29. A system as recited in claim 26, wherein the communication means receives a plurality of packets over regular, periodic intervals, and wherein each of the one or more metering packets is one of a session-ending metering packet and a session-in-progress metering packet.

30. In a computer network that comprises one or more servers providing one or more services to at least one client, wherein some access to the one or more services may incur an access charge and other access to the one or more services may not incur an access charge, and wherein the at least one client may terminate access to the one or more services in a variety of ways, a method of tracking the at least one client's usage of the one or more services, the method comprising acts of:

    sending a login request to a login service;

    accessing, through one or more sessions created in response to the login request, at least one of the one or more services provided by the one or more servers;

    generating one or more metering packets, wherein each of the one or more metering packets includes a time element indicating the client's usage of the one or more services; and

    sending the one or more metering packets to a census service, wherein the census service updates a usage database based on the one or more metering packets so that the usage database reflects the at least one client's usage of the one or more services provided by the one or more servers.

31. A method as recited in claim 30, wherein a plurality of metering packets are generated and sent over regular, periodic intervals, and wherein each of the one or more metering packets is one of a session-ending metering packet and a session-in-progress metering packet.

32. A method as recited in claim 30, further comprising acts of:

receiving a session key associated with the one or more sessions;

hashing at least a portion of each metering packet and the corresponding session key to generate an authentication element; and

storing each authentication element in the corresponding metering packet.

33. A method as recited in claim 30, further comprising an act of sending redundant metering packets to the census service using a communication protocol that does not guarantee delivery.

34. A method as recited in claim 30, wherein the time element comprises a charged time portion corresponding to some access to the one or more services that incurs an access charge, and a free time portion corresponding to other access to the one or more services that does not incur an access charge.

35. A method as recited in claim 34, wherein each metering packet further comprises (i) a packet type element, (ii) a sequence number element, (iii) a session identifier element, and (iv) a packet authentication element.

36. A method as recited in claim 30, further comprising an act of receiving one or more headers from the login service, wherein the one or more headers include at least one of (i) an indication that the at least one client should track usage of the one or more services provided by the one or more servers, (ii) a unique session identifier, and (iii) a metering interval indicating how frequently the at least one client should send metering packets.

37. A method as recited in claim 30, further comprising an act of storing metering information in non-volatile memory.

38. A method as recited in claim 37, further comprising an act of sending the stored metering information to the census service in a subsequent session.

39. A computer program product for implementing, in a computer network that comprises one or more servers providing one or more services to at least one client, wherein some access to the one or more services may incur an access charge and other access to the one or more services may not incur an access charge, and wherein the at least one client may terminate access to the one or more services in a variety of ways, a method of tracking the at least one client's usage of the one or more services, comprising:

a computer readable medium for carrying machine-executable instructions that implement the method, wherein the method comprises acts of:

sending a login request to a login service;

accessing, through one or more sessions created in response to the login request, at least one of the one or more services provided by the one or more servers;

generating one or more metering packets, wherein each of the one or more metering packets includes a time element indicating the client's usage of the one or more services; and

sending the one or more metering packets to a census service, wherein the census service updates a usage database based on the one or more metering packets so that the usage database reflects the at least one client's usage of the one or more services provided by the one or more servers.

40. A computer program product as recited in claim 39, wherein a plurality of metering packets are generated and sent over regular, periodic intervals, and wherein each of the one or more metering packets is one of a session-ending metering packet and a session-in-progress metering packet.

41. A computer program product as recited in claim 39, wherein the method further comprises acts of:

receiving a session key associated with the one or more sessions;

hashing at least a portion of each metering packet and the corresponding session key to generate an authentication element; and

storing each authentication element in the corresponding metering packet.

42. A computer program product as recited in claim 39, wherein the method further comprises an act of sending redundant metering packets to the census service using a communication protocol that does not guarantee delivery.

43. A computer program product as recited in claim 39, wherein the time element comprises a charged time portion corresponding to some access to the one or more services that incurs an access charge, and a free time portion corresponding to other access to the one or more services that does not incur an access charge.

44. A computer program product as recited in claim 43, wherein each metering packet further comprises (i) a packet type element, (ii) a sequence number element, (iii) a session identifier element, and (iv) a packet authentication element.

45. A computer program product as recited in claim 39, wherein the method further comprises an act of receiving one or more headers from the login service, wherein the one or more headers include at least one of (i) an indication that the at least one client should track usage of the one or more services provided by the one or more servers, (ii) a unique session identifier, and (iii) a metering interval indicating how frequently the at least one client should send metering packets.

46. A computer program product as recited in claim 39, the method further comprising an act of storing metering information in non-volatile memory.

47. A computer program product as recited in claim 46, wherein the method further comprises an act of sending the stored metering information to the census service in a subsequent session.